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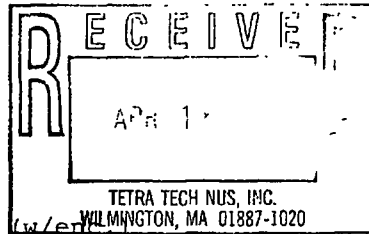
Dear RAB Members:

Enclosed please find a copy of the minutes of the March 20, 2002, RAB meeting.

If you have any questions or concerns, please contact me at (401) 841-7714.

Sincerely,

Michele Imbriglio
Michele Imbriglio



Copy to: (w/encl)
Dr. D.K. Abbass
Ms. Barbara Barrow, Esq.
Mr. John R. Bernardo, III, Esq.
Ms. Mary A. Blake
Mr. Richard D. Coogan
Mr. Paul A. Cormier
Mr. Thurston Gray
Mr. Byron Hall
Mr. Eugene Love
Mr. Manuel Marques
Ms. Elizabeth Mathinos
Mr. James E. Myers
Mr. Howard L. Porter
Ms. Claudette Weissinger
Mr. Richard Gottlieb, RIDEM
Mr. Rick Machado, NUWC
Mr. Robert Jones, COMNAVREG NE
Mr. Brian Bishop
Hon. Paul W. Crowley
Mr. David Egan
Hon. June Gibbs
Ms. Arlene Kalewski
Dr. David Kim
Ms. Virginia Lee
Councilman John Trifero
Councilwoman Jeanne Marie Napolitano
Mr. Joseph McEnness
Ms. Mary Philcox
Dr. Robert Quigley
Mr. Paul Russell
Mr. & Mrs. Raymond Sergerson
Ms. Jennifer Stump, Gannett Fleming

Copy to: (w/enc.) - continued
Mr. John Torgan, Save The Bay
Mr. Matt Weaver, Green Light Foundation
Ms. Kelly Woodward
ATSDR
Brother Joseph
Newport Public Library
Middletown Free Library
Portsmouth Free Public Library
Mr. Ken Finkelstein, NOAA
Mr. Tim Prior, USF&WS
Mr. Gregg Tracey, SAIC
Ms. Diane Baxter, TtNUS

Copy to: (via email w/enc.)
Dr. David W. Brown
Ms. Susan Hester
Mr. John Lennon
Mr. Thomas McGrath
Mr. Ed Moitoza
Mr. Emmet Turley
Mr. John Vitkevich
CAPT R. A. Cooper, NAVSTA
CDR J. Cunha, NAVSTA
CDR D. Burnes, NAVSTA
Ms. Melissa Griffin, NAVSTA
Mr. David Sanders, NAVSTA
Mr. David Dorocz, NAVSTA
Mr. James Shafer, NAVSTA
Mr. Greg Kohlweiss, NAVSTA
Dr. Pamela Harting-Barrat, EPA
Ms. Kymberlee Keckler, EPA
Mr. Paul Kulpa, RIDEM
Mr. Robert Gilstein
CAPT J. Wyman, Retired

Copy to: (via email w/o enc.)
Dr. D.K. Abbass
Ms. Kathy Zitano, NAVSTA

**NAVAL STATION NEWPORT
RESTORATION ADVISORY BOARD MEETING
MARCH 20, 2002**

MINUTES

On Wednesday, March 20, 2002, the NAVSTA Newport Restoration Advisory Board (RAB) gathered at the Officers' Club for its monthly meeting. The meeting began at 7:07 p.m. and ended at 9:05 p.m.

In attendance were John Vitkevich, Claudette Weissinger, Manuel Marques, Byron Hall, Howard Porter, John Lennon, Dr. David Brown, Emmet E. Turley, Thurston Gray, Captain R. A. Cooper (NAVSTA), David D. Dorocz (NAVSTA), Melissa Griffin (NAVSTA), Lillian Orleans (NAVSTA), Greg Kohlweiss (NAVSTA), Jim Shafer (EFANE), Steve Parker (TtNUS), Kymberlee Keckler (USEPA), Dr. Pam Harting-Barrat (USEPA).

David Dorocz opened the meeting.

MEETING MINUTES

David Dorocz asked the RAB for comments on the February minutes. Howard Porter said that the report provided by Emmet Turley, regarding the Hudson River project, was very good. A motion to accept the minutes was heard, and seconded, with the change submitted by Dr. Abbass. The references to the Historical Society should have referred to the Rhode Island Marine Archaeology Project instead.

ACTIVITY UPDATE - JAMES SHAFER

Jim Shafer informed the group that there have been no changes since the last update.

Dr. Brown asked if the recent acts of terrorism would have any affect on the cleanup budget. Mr. Shafer said that they would not. There will probably not be an increase, but also no decrease in the amount of funds.

OLD FIRE FIGHTER TRAINING AREA SEDIMENT RESULTS - STEVE PARKER

Dave Dorocz informed the RAB that Dr. Brown requested a lead-in to each presentation, so he explained the purpose of the presentation. The sediment sampling was performed to better delineate contaminant levels in the eelgrass beds, and throughout the site. The results will be used in the Feasibility Study, which is used to develop a Proposed Remedial Action Plan (PRAP). The PRAP is scheduled to be issued in September 2002. The PRAP will be presented to the RAB for review and comment before it is released to the public.

Steve Parker began with an overview of what has been done to date at the Old Fire Fighter Training Area (OFFTA). The Remedial Investigation was submitted in July of 2001. The Draft Final Feasibility Study will be out within the week.

For the Feasibility Study, they evaluated remedial actions to address the sediments as well as the soil. Preliminary Remediation Goals (PRGs) were established, which are cleanup goals. They identified some complicating factors: the eelgrass, rubble on the shoreline, and a few other problems that might come into play during a dredging scenario. Because of these items, they found a need for additional sediment investigation. Since then, the PRGs have been revised, and will be described in the Feasibility Study.

The targets that appear on the map of Coasters Harbor Island (CHI) (Enclosure 1, Pg. 2) are where the sediment samples were taken during the Risk Assessment and Remedial Investigation portions of the investigations. They found that some stations along the shoreline exceeded the PRGs. Because there were only a few, they wanted to find out the extent of the contamination. They calculated three risk groups that would be directly affected by the contamination: people recreating on the beach, people ingesting lobster (with an average of three meals/year of lobsters resident to that area), and exposure to the ecological receptors (fish, shellfish, birds, worms, etc.) in the area.

Each group is specific to certain areas of the site. Lobsters tend to live in deep water, so they are only

exposed to the sediment in deep water. People recreating at the beach are only exposed to the sediment on the upper path of the beach, above the low-tide line.

The Chart of the site (Enclosure 1, pg. 3) shows the three groups and how the PRGs relate to each. The Polyaromatic Hydrocarbons (PAHs) are found in oil, soot, and asphalt runoff. The pesticides show up because they are toxic, but are not believed to be associated with the site. The metals tend to be ubiquitously high in harbor sediments such as those found on CHI. The sediment investigation looked at these contaminants, so that a line could be drawn to establish where they are found in excess of the PRGs.

The next step was to identify the eelgrass, and map it out. A grid was put out over the area, and sediment was collected at 100-ft. intervals, then within the grid at 50-foot intervals in certain areas for additional samples. 81 samples were collected in 53 different locations, some at one-foot depths, and others at two-foot depths. The results were then compared to the PRGs.

Enclosure 1, page 4 shows a screen capture from the Environmental Geographic Information System. The eelgrass beds are shown to the left (west), within the lines. The dots are the sediment samples that were collected during the investigation. The lower slide shows the core sampling device that was used. Enclosure 1, page 5 has two slides showing the final steps of the sampling process.

Enclosure 1, page 6 is a map of the sampling results. The medium gray area is the site between the low tide line and the top of the bank (the inner tidal zone). The light gray area is the eelgrass bed offshore. The targets are sample stations. The four dark gray, outlined areas directly offshore are the areas that exceeded the PRGs. The straight line in the middle of the slide is the storm drain that directs rainwater from the parking area to the beach, and its outfall area is one of these shaded areas. The bottom slide shows what the "beach" areas (actually an inner tidal zone) look like. The photo on the left is the west side, the one on the right is the eastern area. Both are mostly rocks and rubble, with very little sand.

Enclosure 1, page 7 has two views of the underwater environment at the sampling sites.

Mr. Parker discussed the recommendations and the possible alternatives of remedial action. John Lennon asked if any other marine life had been tested, and Mr. Parker said that four different types of shellfish (mussels, clams, lobsters and scallops), along with fin fish were tested. The lobster testing showed a greater lifetime risk than any of the others. The lifetime ingestion of clams also exceeded the risk range, but the lobster ingestion scenario was used because the risks from that pathway were higher. A footnote to this answer is that the risk from all the shellfish ingestion scenarios was dominated by arsenic, the toxicity of which is somewhat questionable. Emmet Turley asked if there was a known source for the arsenic contamination. Mr. Parker said that it is a natural component of the bedrock on Aquidneck Island. It may also be from the pesticide use by farmers and the Navy. Mr. Turley wanted to know if any of the arsenic could have leached in from the pressurized lumber used along the shore. Jim Shafer said that it might be possible. John Lennon asked if the source of the contamination was being dealt with. Captain Cooper explained that the onshore work was presented separately from the offshore portion.

The alternatives were discussed next. The law requires that the option of "no action" be considered. The other options are graduated from monitoring and use restrictions to removal of all sediment that exceeds the PRGs. It was decided not to impose a shellfishing ban. The idea of capping the site was also eliminated as an option. A few RAB members asked why the contaminated sediment in the eelgrass bed would not be removed. Mr. Parker said that the percentage of contamination was very small - .05 acres of the bed, or a few hundred square feet. If the eelgrass were to be removed for dredging, a valuable habitat would be destroyed and we would be obligated to restore it, which would be very expensive and may be unsuccessful. It is believed that the contaminants are washing offshore due to erosion, and drifting eastbound because of the wind and current.

Discussion began about the amount of use the offshore area gets, and both Captain Cooper and Melissa Griffin assured the RAB that the area is fairly secure. It is not used for fishing or lobster fishing because it is very shallow and rocky. Security forces also patrol the area

regularly. Members of the RAB asked about the outfall area at station 5 (see Enclosure 1, page 2 - top slide). The area in question is at the end of a drainage pipe that transports rainwater from the parking area to the bay. It is unclear whether the elevated levels of contamination are due to parking lot runoff or if the outfall pipe is acting as a conduit for subsurface contamination. If the onshore portion is the source, then the cleanup of the onshore area should correct the problem. Jim Shafer noted that the drains themselves are kept updated with regular engineering efforts.

NEW BUSINESS

John Vitkevich told the RAB about his visit to the South Weymouth RAB meeting on Thursday, 14 March 2002. That station is closed, and covers an area of 1458 acres. It is a former Naval Air Station, and is experiencing different cleanup problems than NAVSTA. They have a facilitator at their meetings from the Massachusetts Office of Dispute Resolution. The facilitator creates the agenda, makes sure that the meeting follows the agenda, and makes sure that all the issues get addressed. During the meeting, the facilitator would identify the action items and make sure that they get answered by the next meeting. Dave Dorocz suggested that the RAB compile a list of available facilitators to choose from.

Kymberlee Keckler asked that the agenda for each RAB meeting be mailed out well in advance, so that the members can prepare for the meeting. She also would like the correct webpage address sent out to the members.

COMMITTEE REPORTS

PROJECT COMMITTEE

Emmet Turley gave his project report. He submitted copies to be included in this report. (See Enclosures 2 and 3)

MEMBERSHIP COMMITTEE

John Vitkevich asked John Lennon to become a part of the RAB. He also suggested that newcomers and guests be introduced at the beginning of each meeting. Howard Porter stepped down as chair for the Membership Committee. Thurston Gray volunteered to be the Chairperson of the Membership Committee. John Bernardo, Elizabeth Mathinos and Eugene Love have all tendered their resignations.

PUBLIC INFORMATION COMMITTEE

Dr. David Brown volunteered to be the new Public Information Representative. He asked for suggestions on how to attract new members and guests to the RAB. Captain Cooper suggested that the RAB write an advertisement, and the Navy would get it published.

PLANNING COMMITTEE

No report as committee chair was not present.

EDUCATION COMMITTEE

No report as committee chair was not present.

NEXT MEETING

The next meeting of the Restoration Advisory Board (RAB) is scheduled for Wednesday, **April 17, 2002**, at 7 p.m., at the Officers' Club.

The meeting was adjourned at 9:05 p.m.

Enclosures:

- (1) RAB Technical Presentation: OFFTA
- (2) Project Committee Report

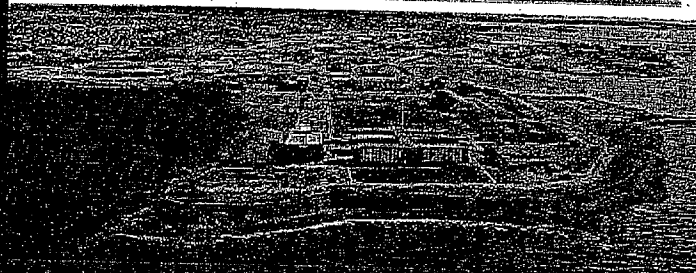


RAB Technical Presentation: Old Firefighting Training Area Sediment



Naval Station Newport

Newport, RI

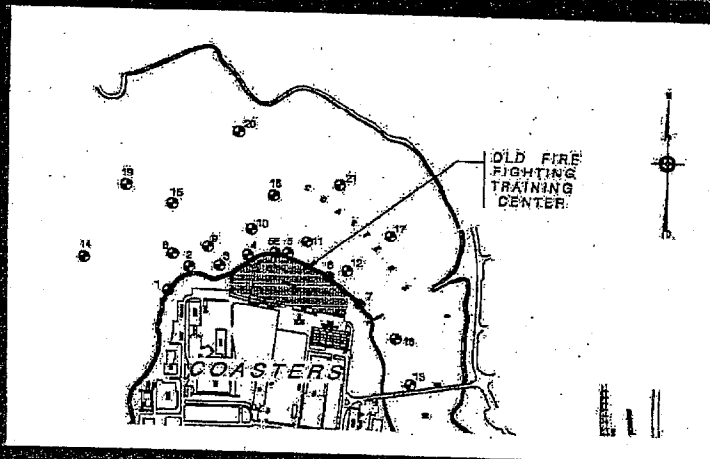


OFFTA: Where We Are

- Remedial Investigation Completed
- Draft Feasibility Study
 - Evaluated Dredging needs and options
 - Draft “PRGs”
 - Identified complicating factors
 - Additional Sediment Investigation
- PRGs revised



Old Firefighting Training Area



Sediment PRGs

- PRGs Calculated for three risk endpoints
 - Exposure to persons on the “Beach” (recreational / residential)
 - Exposure to persons via lifetime recreational ingestion of lobster (3x per year)
 - Exposure to ecological receptors



Preliminary Remediation Goals

Contaminant	Ecological PRGs (2)	Human Health	Lifetime Recreational
		Lifetime Recreational Exposure PRGs	Lobster Ingestion PRGs (1)
Polyaromatic Hydrocarbons (ug/kg)			
2-Methylnaphthalene	185		
Acenaphthylene	597		
Benz(a)anthracene		1338	34270
Benzo(a)pyrene		134	5360
Benzo(b)fluoranthene		1338	51266
Dibenz(a,h)anthracene	2434	134	6742
Indeno(1,2,3-cd)pyrene	5633		72519
PCB/Pesticides			
Total PCB Congeners			175
Metals (mg/kg)			
Arsenic**		5.2**	5.45
Cadmium			10
Chromium			3708
Mercury			2.3

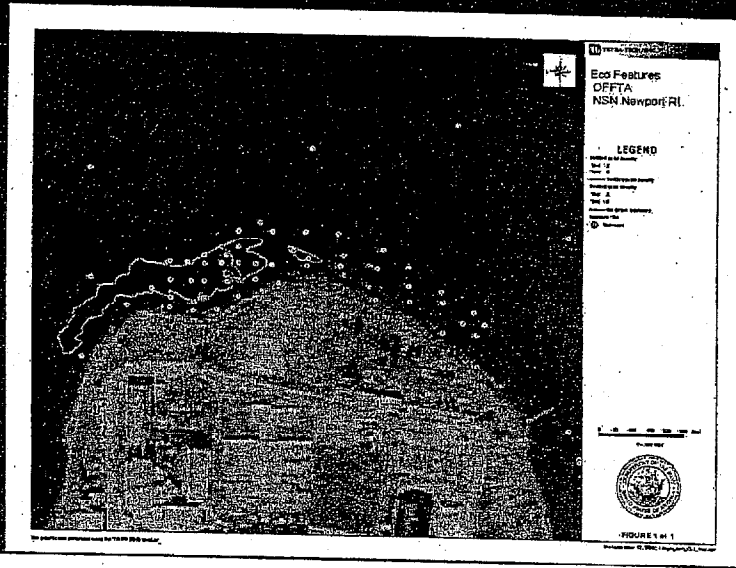


Sediment Investigation

- Identified eelgrass in west side of Coasters Harbor
- Collected surface and deep (two feet) sediment samples
- Compared results to PRGs



Ecological Features



Sampling

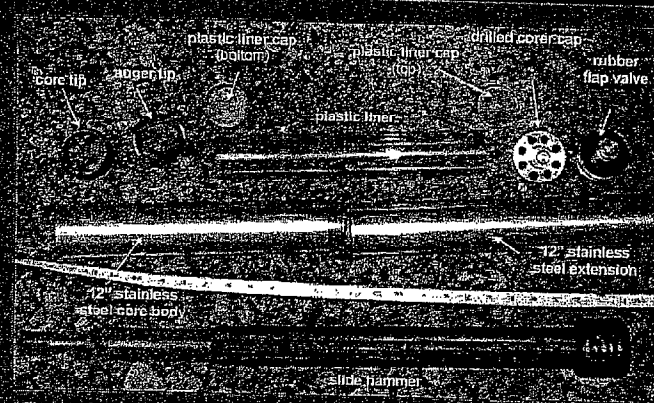


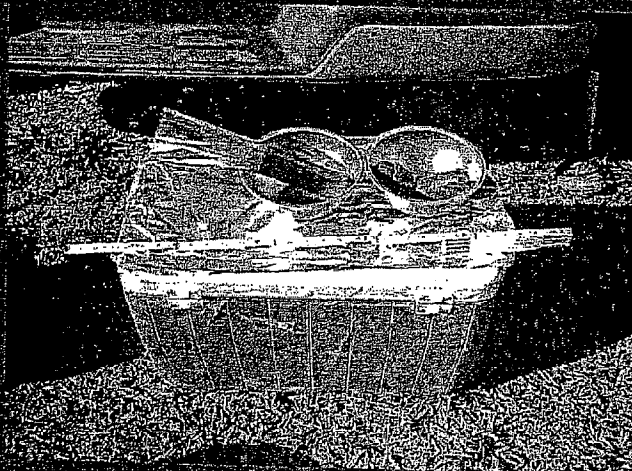
Figure 1. Core sampler components.



Sampling

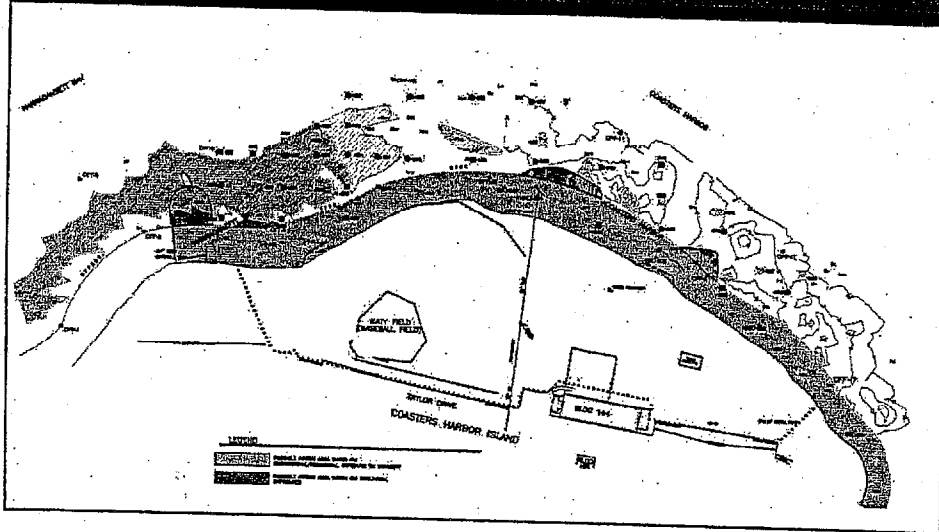


Sampling

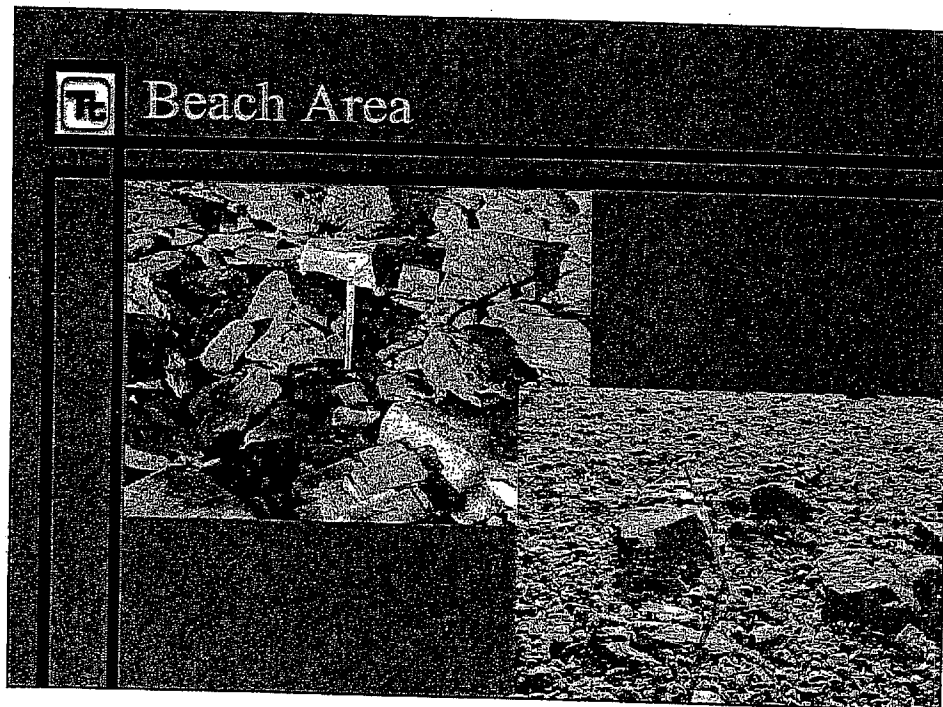




Sediment Exceeding PRGs

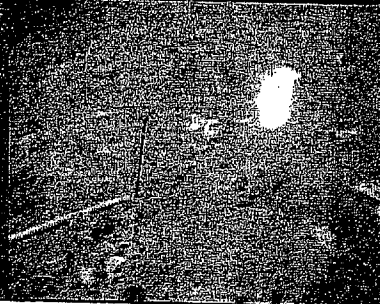
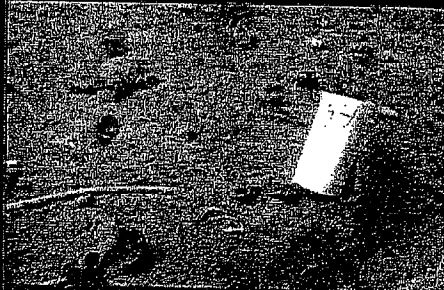


Beach Area

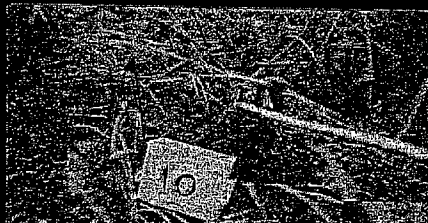




Inner Harbor



Eelgrass Area





Recommendations

- Consider the “Beach” for remedial action due to risk from recreational use of the beach
- Consider the sediment below the low tide line exceeding PRGs for remedial action due to risk to ecological receptors



Possible Alternatives

1. No Action
2. Monitoring and use restrictions (fencing and signage)
3. Removal at beach area, monitor off-shore area
4. Removal at beach and off-shore areas, but not within the eelgrass
5. Removal of all sediments exceeding PRGs

March 20, 2002

Newport Restoration Advisory Board

Project Committee Report

"The "Punaise": A Remotely Operated Submerged Dredged System"

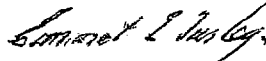
This month's information deals with innovative dredging technologies that the U.S. Army Corps of Engineers conduct in their Dredging Operations and Environmental Research Program, at its Waterways Experiment Station.

Most advances in the dredging industry are modifications to existing equipment, however this article concerns the development of a new dredging concept, a remotely operated submerged dredged system. This technology allows dredging operations in and near navigation channels with minimal impact on ongoing navigation.

It appears to have many advantages, such as being submerged, remote controlled, shore connected, an automated operation, requires one operator, and is adept at working in storm conditions at relatively low costs.

Researchers believe this dredging system will be of great benefits in addressing dredging and bypass problems around the many inlets along the sandy U.S. east coast.

Submitted by:



Emmet E. Turley, Project Chairperson

Enclosure 2

The Punaise: A Remotely Operated Submerged Dredged System

by Gregory L. Williams¹ and Kris Visser²

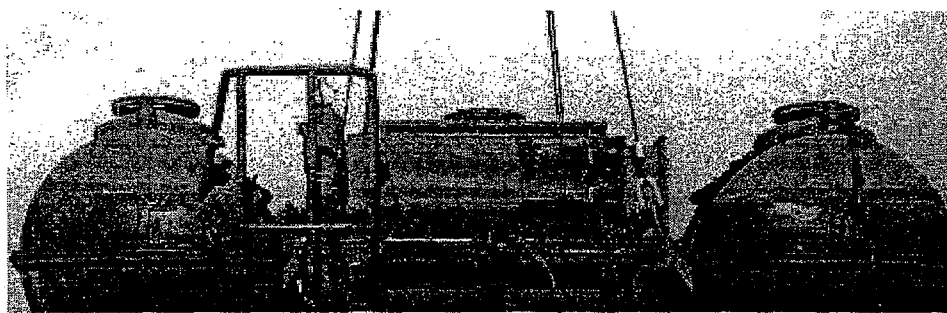
This paper is not an endorsement for any particular technology or dredging company, but is intended to identify a technology with potential application in the United States.

The Innovative Dredging Equipment and Processes Technology focus area of the U.S. Army Corps of Engineers Dredging Operations and Environmental Research program is being conducted at the U.S. Army Engineer Waterways Experiment Station (WES). This focus area will demonstrate and document emerging dredging and disposal technologies available from both domestic and foreign dredging interests for application to Corps dredging projects. Most advances in the dredging industry are modifications to existing equipment. Very infrequently, a new dredging concept is developed. The *Punaise* is new dredging technology which has not yet operated in the United States. The first *Punaise* was designed for silt removal and used in 1991 in The Netherlands. Since then, a second system has been constructed to transport sand for beach nourishment activities. PinPoint Dredging Company, a partnership of J. G. Nelis, Ballast Nedam Dredging, and Boskalis International, operates the *Punaise* and most recently used it at a beach nourishment project on the Dutch coast during 1996.

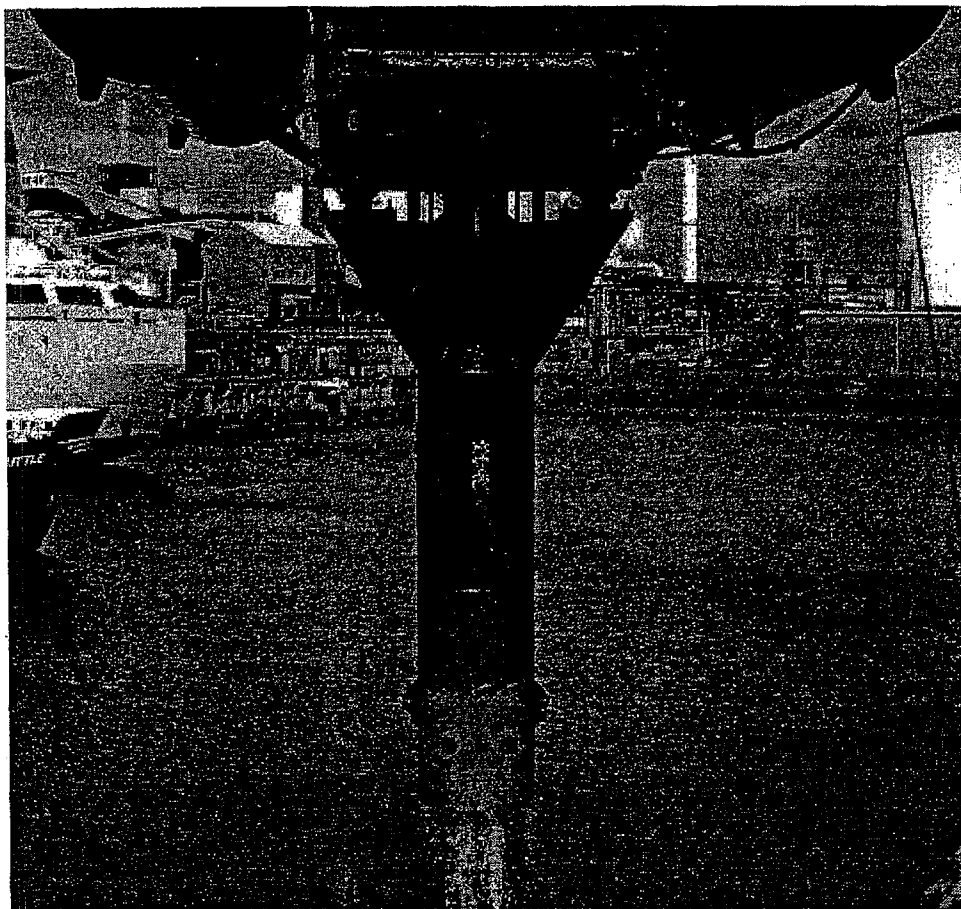
The *Punaise* (Dutch for thumbtack) is a remotely operated, watertight submerged dredge that resides on the seafloor, pumps sediment without impact to navigation, and is not affected by storms. Because it is located on the seafloor, it is very tolerant of adverse surface wave action, which allows it to operate in all types of weather and sea state conditions. The *Punaise* is connected to a shore station by an umbilical, which serves not only as the communication connection but also as the discharge line through which the dredged slurry is pumped. The entire dredging process, including sinking and floating (i.e., filling and emptying ballast tanks), is controlled from the shore station by one person. The *Punaise* can thus operate for long periods with relatively low labor costs. Maximum flexibility in sediment removal is attained through repositioning the *Punaise* at the dredging site from time to time with the help of a tug.

Operational Principle

The *Punaise* operates under the principle of deep dredging (i.e., putting the dredge pump as close to the sediment intake as possible). In so doing, the *Punaise* always requires an embedded support that must extend below the suction intake for vertical stability during dredging. Figures 1 and 2 show the two existing *Punaises* (PN250 and PN400, respectively), which contain a dredge pump, electric motor, instrumentation, suction intake, and vertical support. Specifics for each model are shown in Table 1.



During setup prior to dredging, the shore station is established and the umbilical is floated to the dredging site. The *Punaise* is then connected to the umbilical and positioned at the appropriate location.



appropriate location for sinking to the seafloor. Once positioned, the ballast tanks are filled and the *Punaise* settles to the bottom. Fluidisers are then activated, which allows the vertical support (an extension of the suction pipe) to settle into the sand bottom. When the suction intake reaches the level of the bottom, dredging begins. As material is removed, a crater or pit is formed with the *Punaise* located at the lowest point. Dredging continues and the crater/ pit size grows (*Punaise* settles further into the bottom) until either the desired dredging depth is reached or resistant bottom features (e.g., bedrock, clay) prevent further settling.

Figure 1. The Punaise PN250

Energy and Data Supply

Electrical power is supplied by two diesel-driven generators located at the shore station on the beach. The total installed electrical power is approximately 1,200 kW, with 800 kW/3,000 V used for the sand pump electric motor and 150 kW/ 660 V used for the auxiliary equipment. The umbilical is composed of 11-mm core diameter electrical cables, which provide a relatively cheap and flexible system so that future changes in working distance and/or electrical power can easily be adapted.

Figure 2. The Punaise PN400

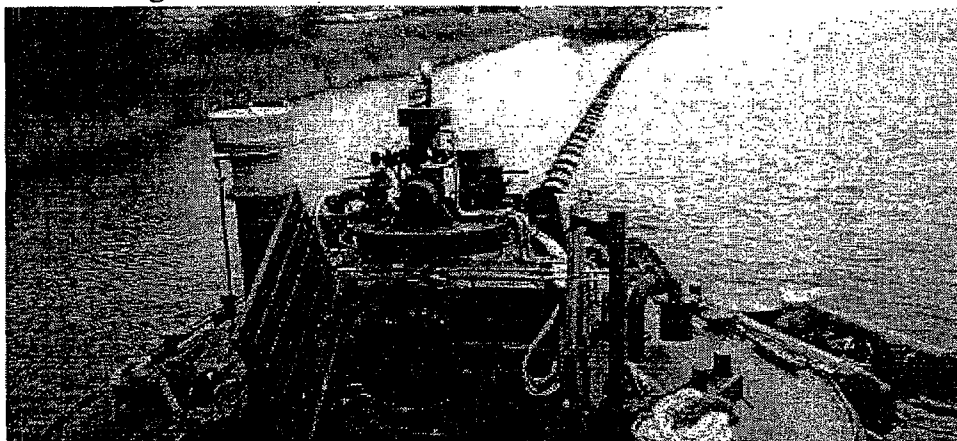




Table 1. Punaise Design Specifics

	PN250	PN400
Width	7.8 m	8.5 m
Height (without suction pipe)	3.1 m	6.0 m
Height (with suction pipe)	8.5 m	8.7 m
Draft	7.5 m	6.5 m
Working depth	30 m	40 m
Required sediment thickness Initial production Maximum production	6 m 8 m	7 m 10 m
Pump capacity	800 cu m/hr @ 87 psi	2,400 cu m/hr @ 116 psi
Discharge pipe diameter	4.0 cm	6.2 cm
Weight	52 tons	105 tons

Remote Control Dredging

The unmanned dredge is controlled by one operator from the shore station using standard personal computers for visualizing and controlling all the processes for signal input and output. All signals (420 digital and 105 analog) are updated and logged every second. All processes (except diving and floating) are fully automated so the operator only tracks operation status, which is visualized on a monitor. Diving and floating remain manually controlled because the various external factors require an experienced operator. The dredging process is displayed on a separate monitor, which includes a window showing the last 10 min of operation to track trends. Additionally, the complete filling of the 1,500-m discharge pipe is shown so the operator can determine the specific critical flow based on the mass of sand in the pipe. The primary variable which the operator can influence is density. Using water jets at the suction mouth and two bypass valves located immediately before the pump entrance, the operator can easily adjust the sand/water mixture with only a few mouse clicks at the computer. Another monitor shows the status of shore-based equipment (generators, air compressors, and fuel supply). Finally, daily reports showing production results, equipment status, fuel consumption, and Punaise movements and location can be produced at the end of each day's operation.

In the event of a fiber-optic failure where communication between the dredge and shore station is lost, the dredge can operate autonomously via a special program in the dredge. If the connection fails, the dredge automatically opens all the bypass valves and pumps clean water to shore, thereby removing all of the sand from the discharge pipe. To retrieve the dredge, the operator can supply air at 70 psi to the *Punaise* through one of two air hoses in the umbilical, which allows the dredge to empty its ballast tanks and rise to the surface.

Table 2. *Punaise* Projects in The Netherlands

	Bloemendaal	Zandvoort	Heemskerk
Year	1994	1994	1996
Volume	255,000 cu m	350,000 cu m	475,000 cu m
Length of replenishment	2,500 m	2,000 m	1,600 m
Volume per length	103 cu m/m	175 cu m/m	297 cu m/m
Fill elevation	+ 3.5 m mwl	+ 3.5 m mwl	+ 4.0 m mwl
Slope	1:30	1:30	1:30
Maximum pumping distance	2,700 m	2,000 m	1,900 m
Length of submerged pipeline	1,000 m	1,000 m	1,100 m

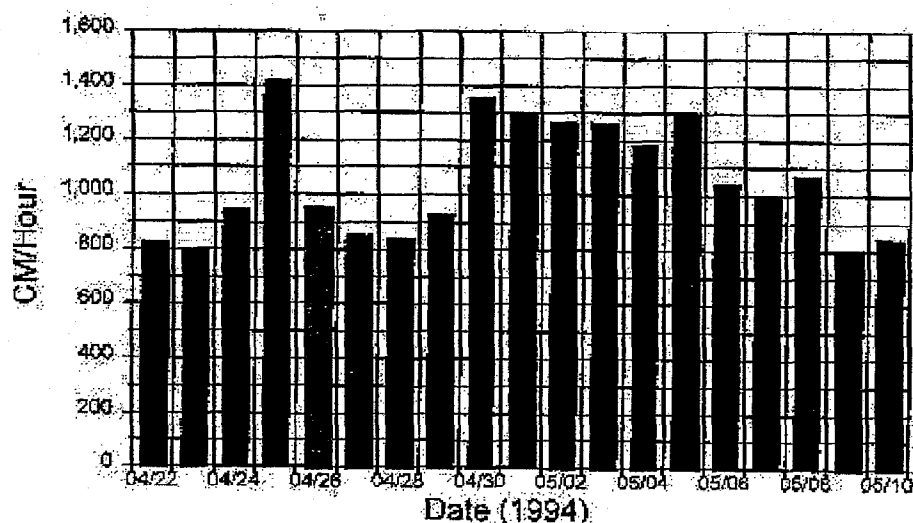


Figure 3. Average Punaise hourly production by day at Bloemendaal

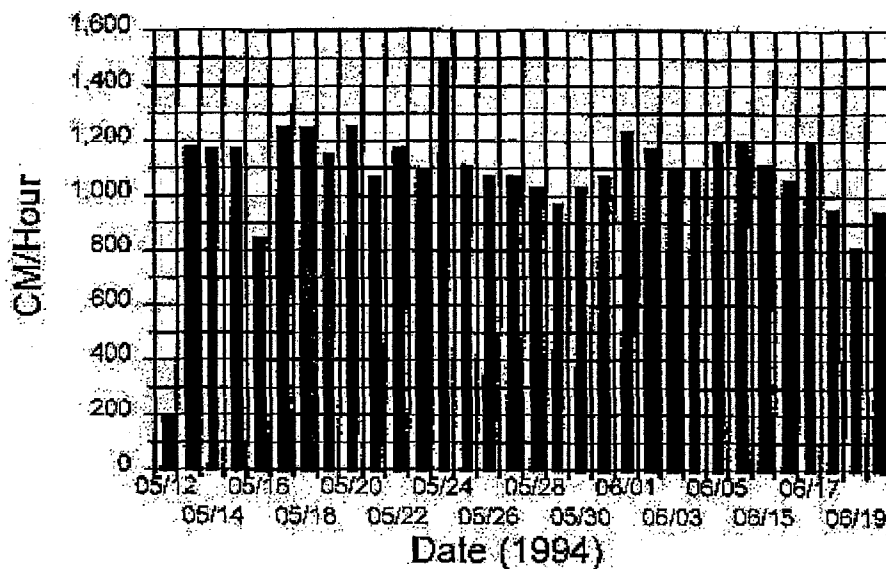


Figure 4. Average Punaise hourly production by day at Zandvoort

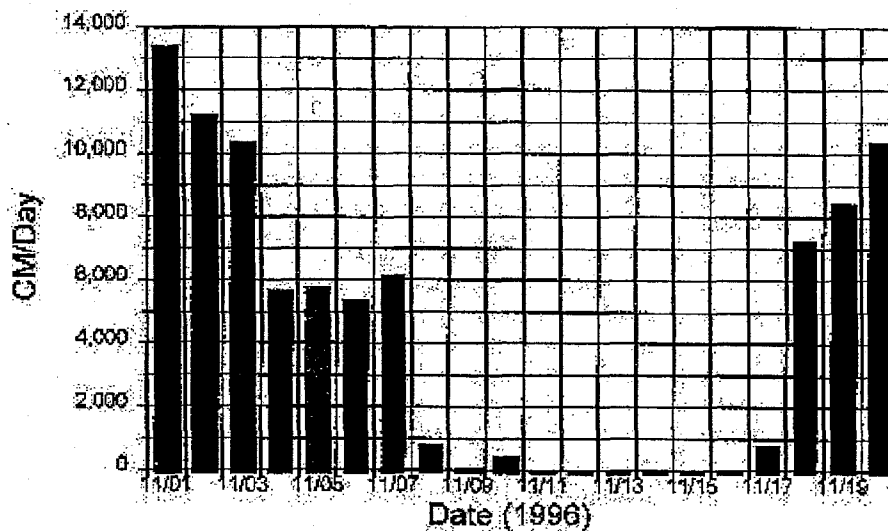


Figure 5. Average Punaise hourly production by day at Heemskerk

Beach Replenishment Projects in The Netherlands

The dredge *Punaise* PN250 was initially used to remove 600,000 cu m of silt per year for 2 years from Flushing Harbour in The Netherlands. The system proved to be so effective that a demonstration contract was signed between the Dutch Ministry of Public Works (DMPW) and the contractor (J. G. Nelis) to conduct beach nourishment projects. The decision was made to construct a bigger and more powerful dredge (*Punaise* PN400) specially suitable for pumping sand from a borrow pit at sea in the coastal zone. *Punaise* PN400 was constructed primarily for three projects, all on the central North Sea coast west or northwest of Amsterdam. Details of these projects are summarized in Table 2.

Production

For the 1994 projects, the DMPW monitored the effects of a temporary sand rehandling pit in front of the coastline at -7.0 m mwl. The monitoring program indicated that negative effects on the coastal morphology and the macrobenthic community on the seabed adjacent to the borrow pit area were either small or immeasurable. Turbidity levels measured in the breaker zone did not exceed the usual background values and there was no evidence of any movement of the pit in any direction. The *Punaise* was allowed to create its own pit to meet the total quantity to be dredged with no limitation placed on pit size. Total dredging depth was limited to -25.0 m mwl, and the resulting pit was kidney-shaped.

For the project conducted in 1996, the *Punaise* was restricted to work in a 100-m by 60-m area at a depth of -25.0 m mwl. The contours of the rehandling pit at the original depth were 250 m by 150 m. After removing 150,000 cu m from the pit, the *Punaise* received dredged material dumped from a hopper dredge for onshore pumping.

The 1994 projects were conducted in April and May during calm/normal weather conditions. The average hourly productions per day are shown in Figures 3 and 4 for Bloemendaal and Zandvoort, respectively. In October and November 1996, the DMPW initiated the beach nourishment project at Heemskerk to test the performance under heavy weather conditions. During the 2-week period from 1-13 November, the system was tested during a series of storms. A wave rider buoy located offshore recorded storm conditions approaching 10 on the Beaufort Scale, described as: (a) very high waves with long overhanging crests; (b) mean wind speed 52 knots; (c) probable wave height about 9.0 m.

During the first days of the storm, production increased because of an increasing pit production, and the pit slopes changed from 1:3 to 1:5 as a result of breaking waves. After dredging and pumping approximately 150,000 cu m from the pit, additional material was to be supplied by a hopper dredge near the beginning of the storm period. However, owing to the adverse weather conditions, hopper dredge operations did not begin until 13 November. This test thus showed the vulnerability of a continuous production if a hopper dredge and *Punaise* are used together when weather is uncooperative. Figure 5 shows the daily production of the *Punaise* during this time period.

Cost

To minimize cost for mobilization and installation, all of the equipment except the hull of the dredge is stored in containers and transported by ship to a harbor near the dredging location. Assembling of the discharge pipeline and umbilical, and establishing the units for control and power supply normally takes about 4 weeks. The unit cost for dredging the three demonstration projects conducted in The Netherlands was \$4.71/cu m (\$3.60/cu yd).

Punaise Operations in the United States

The State of New York and PinPoint Dredging Company planned to demonstrate the *Punaise* system at Shinnecock and Jones Inlets on the south shore of Long Island during January-February 1997. This demonstration was intended to investigate the feasibility of using the *Punaise* to conduct sand bypassing at structured inlets in the United States. A detailed effort to monitor equipment effectiveness, crater surveys, and beach surveys near the crater and placement sites was planned. Shinnecock and Jones Inlets each have chronic downdrift erosion problems, so the demonstration would have provided an opportunity to evaluate the technology as well as place much needed sand on the downdrift beaches. The demonstration was to have bypassed approximately 153,000 cu m from each inlet to the downdrift beaches. Assuming an equal distribution of mobilization/demobilization costs between inlets, total project costs were estimated at \$810,000 for Shinnecock and \$910,000 for Jones. These costs translate to respective unit costs of \$5.29/cu m (\$4.05/cu yd) and \$5.95/cu m (\$4.55/cu yd) at each inlet. Cores taken at each site indicated that no more than a 6.1-m-thick layer of

clean sand was available for dredging at either site. Since this sand thickness was insufficient to support maximum production (see Table 1), the *Punaise* demonstration project was canceled. Although the PN250 (and possibly the PN400) could probably have dredged some sand, the location of a clay layer would have required frequent repositioning, thus reducing dredging efficiency and greatly increasing cost.

No other project has considered using the *Punaise* system for dredging in the United States. One reason for lack of U.S. work relates to issues associated with the Merchant Marine Act of 1920 (more commonly known as the Jones Act), which might have limited the ability of the *Punaise* to operate in waters of the United States since it is not a U.S. flagged vessel. Before the State of New York could enter into a contract to use the *Punaise* for bypassing at Shinnecock and Jones Inlets, the state had to seek a ruling from the U.S. Customs Service on whether the *Punaise* dredging system was prohibited by the Jones Act. In August 1996, the U.S. Customs Service issued a ruling on the legality of *Punaise* operations in the United States. The U.S. Customs Service decision is based on two requirements from the law, namely that to be prohibited, ...it must be engaged in dredging and must be a vessel. The U.S. Customs Service showed that the *Punaise* was indeed involved in dredging, but since it neither carried a crew nor merchandise, nor was it self-propelled, it could not be considered a vessel. Therefore, the *Punaise* is not prohibited by the Jones Act from working in the United States.

In 1996, the Dutch dredging companies J. G. Nelis, Ballast Nedam Dredging, and Boskalis International entered into an agreement for the exploitation of the Pinpoint technology with the dredges *Punaise* PN250 and PN400. All three partners are working together in this agreement to develop and improve this innovative dredging method. Stuyvesant Dredging Company, New Orleans, Louisiana, fully owned by Boskalis International, is the primary contractor of the *Punaise* in the United States. Currently, there are plans to build a *Punaise* dredge (PN250) to specifically address dredging and bypass problems around the many inlets along the sandy U.S. east coast. PinPoint Dredging expects to execute the first demonstration project in the United States in 1998.

Conclusions

The *Punaise* is a new concept in dredging technology that allows dredging operations in and near navigation channels with minimal impact on ongoing navigation. Some of its advantages are as follows:

- Submerged system.
- Operated via remote control.
- Connected to shore by a communication/discharge umbilical.
- Requires only one operator.
- Automated operation.
- Has mobility for movement within a borrow area or to other locations.

Previous work in The Netherlands has proven the technology to be an effective system to dredge and pump material for traditional beach nourishment projects. The *Punaise* is also especially adept for working in storm conditions at relatively low costs. The *Punaise* is not restricted by the Jones Act for operations in the United States. Pinpoint Dredging is currently considering a design modification to allow better access to thicker sand layers in shallower waters.

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